

mean place of Jupiter," the argument is now the time interval from the epoch of the Kaliyuga, so that the table is available for more than 3000 years further back; while Table XXXIV. is now given for days, hours, and minutes, instead of days, ghatikās, and palas.

The tables are clearly printed and the volume is furnished with a comprehensive index. To the Indian epigraphist and many others the volume should prove a welcome supplement to the "Indian Calendar."

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THE ANTIQUITY AND EVOLUTION OF MAN.

- (1) *Man and His Forerunners*. By Prof. H. v. Buttel-Reepen. Incorporating Accounts of Recent Discoveries in Suffolk and Sussex. Authorised Translation by A. G. Thacker. Pp. 96. (London: Longmans, Green and Co., 1913.) Price 2s. 6d. net.
- (2) *The Origin and Antiquity of Man*. By Dr. G. Frederick Wright. Pp. xx+547. (London: John Murray, 1913.) Price 8s. net.
- (3) *L'Uomo Attuale una Specie Collettiva*. By V. Giuffrida-Ruggeri. Pp. viii+192+xiii plates. (Milano: Albrighi, Segati e C., 1913.) Price 6 lire.
- (4) *Die Rehobother Bastards und das Bastardierungsproblem beim Menschen*. Dr. Eugen Fischer. Pp. vii+327+19 plates. (Jena: Gustav Fischer, 1913.) Price 16 marks.

(1) **I**N this excellent translation of Prof. Buttel-Reepen's little book, with the German title altered to "Man and His Forerunners," the statement occurs that "general treatises on Pleistocene man published before 1908 are now almost valueless." Such a statement implies that our knowledge regarding the ancestry and evolution of man has been revolutionised in the last five years—a statement which no one familiar with the subject could support for a moment. Yet in that space of time certain events have occurred which do materially alter our conception of how and when mankind came by its present estate.

There is, in the first place, the discovery of definite types of worked flints beneath the Red Crag of East Anglia by Mr. J. Reid Moir. Prof. von Buttel-Reepen does not question that the sub-Crag flints show human workmanship, but he seeks to minimise their antiquity by withdrawing the Red Crag from the Pliocene formations and setting it at the commencement of the Pleistocene series—a change which we believe geologists will not be inclined to countenance. Even if the place of the Red Crag be changed to the commencement

of the Pleistocene, the sub-Crag flints may still claim a respectable antiquity, for the author quotes with approval Penck's estimate of 500,000 to 1,500,000 years as the duration of the Pleistocene period, and 25,000 years as the time which has elapsed since the Pleistocene closed.

It is during the last five years that we have come to realise fully the significance of Neanderthal man. He was formerly regarded as our Pleistocene ancestor. The recent discoveries in France and a more exact study of prehistoric remains have made amply clear that Neanderthal man is so sharply differentiated in all his features from modern man that we must regard him not as an ancestor, but as a totally different and collateral species, and that in past times there was not one species of man—subdivided into varieties as at present—but that there existed several, perhaps many, different species of man.

We note that Prof. von Buttel-Reepen gives his adhesion to the theory of multiple human species. On the other hand, we also observe that Dr. Frederick Wright, in the "Origin and Antiquity of Man," adopts the view, usually held by geologists, that Neanderthal man is merely a variant of modern man, and brings forward the time-worn examples of Robert the Bruce and the mediæval Bishop of Toul as representatives of Neanderthal man in modern times. The difference between the crania of Robert the Bruce and Neanderthal man is almost as great as that which separates the skulls of the chimpanzee and gorilla.

The third event which has altered our conception of man in the past is the discovery made by Mr. Charles Dawson in a pocket of gravel by the side of a farm-path, at Piltdown, Sussex. The discovery is noted by three of the authors whose books are here reviewed, and it is interesting to see what opinion each of them has formed of *Eoanthropus dawsoni*. Prof. von Buttel-Reepen gives us the first surprise; he places this new species of humanity with Neanderthal man, between the second and third glacial phases of the Pleistocene. It is true that Mr. Dawson and Dr. Smith Woodward did use the term Chellean—which refers to the stage of flint workmanship usually supposed to have been reached between the second and third of Penck's glacial phases—but they were also careful to explain that they regarded the Piltdown gravel as having been deposited and the skull imbedded at a period long anterior to the Chellean age—namely, at the early part of the Pleistocene period—perhaps earlier.

As to the position of *Eoanthropus* in the human lineage, all our authors show circumspection. Prof. von Buttel-Reepen is "inclined to think that the anterior curve of the jaw passed more sharply

upwards than in Woodward's reconstruction, and that the whole front of the jaw, and consequently the front teeth, were somewhat smaller and more human than he believes." There is no doubt this is the case; a close study of the faithful replicas of the jaw which are now freely in circulation will show that there is neither indication of, nor accommodation for, the large canine tooth postulated by Dr. Smith Woodward. It is true the conformation of the chin is purely simian. It is a feature never before observed in a human skull, but a simian chin does not necessarily indicate a large canine tooth.

The discovery at Piltdown evidently puzzled the author of "l'Uomo Attuale"—Prof. Giuffrida-Ruggeri, of Naples, one of the most expert anthropologists in Europe. He is naturally puzzled by the statement of the discoverers that they regard *Eoanthropus* as a contemporary of the Heidelberg man, and that flints of the Chellean type were found with the remains—flints of that type belonging to a much later date than that of the Heidelberg jaw. He adds that it was impossible for him to make any further statement regarding the nature of *Eoanthropus* until figures, or, better still, actual models of the remains were at his disposal. By this time such models are probably at the Neapolitan professor's disposal, and he will have noted, as students of anatomy are certain to observe, that owing to the manner in which the bones of the skull-case have been put together, the brain-size of *Eoanthropus* has been greatly under-estimated. The size of brain is that of modern man—somewhere about, or a little above, 1500 cubic centimetres. The importance of the discovery of *Eoanthropus* will be thus apparent. At an early part of the Pleistocene period, perhaps much earlier, there existed human beings with a brain of the modern size, but a chin which was purely simian in conformation.

(2) In discovering the evidence on which the long-past history has to be based three classes of men are involved—the geologist, the archaeologist (or lithologist), and the anatomist. It is unlikely that any one man could attain such a knowledge as to become an expert in all three lines of investigation. The geologist must be our time-keeper and time-marker, especially as regards the Pleistocene—the geologist who has paid special attention to the evidence relating to the phases of glaciation. For this reason a work on the origin and antiquity of man, by Dr. Frederick Wright, who has been a life-long student of the glacial phenomena of North America, is of especial value. There is nothing concerning the origin of man in Dr. Wright's book, but much which bears on the length of

the Pleistocene period and the relation of man to that period. Penck, from his studies of the glacial deposits in Europe, estimates that the Pleistocene was at least half a million years in duration, perhaps a million and a half. Dr. Frederick Wright's investigations in America have led him to infer that 80,000 years is an ample estimate of the duration of the Ice age from its inception to its close. He admits the existence of pre-Glacial man. "Large areas," he writes, "in Europe and North America which are now principal centres of civilisation were buried under glacial ice thousands of feet thick, while the civilisation of Babylonia was in its heyday (5000 B.C.). . . . Both in its inception and in its close the Glacial epoch was a catastrophe of the most impressive order. No reasoning from present conditions can apply to the Glacial epoch without great reservation."

It will thus be seen that Dr. Frederick Wright has returned to the manner of thinking which was prevalent before the days of Lyell. He is an advocate of "Paroxysms of Nature." By a paroxysm of human evolution—one is inclined to substitute the word "miracle"—he thinks the early civilisation of Babylon and of Egypt may have hurriedly arisen and primitive mankind become separated into the well-marked varieties which are seen in our present-day world. It must also be noted that the duration assigned to the last phase of glaciation by Dr. Wright is in complete agreement with the computations given by the late General Drayson. In one matter especially anthropologists are much beholden to Dr. Wright. He has no hesitation in declaring that the human skeletons found under the loess at Lancing on the Missouri and at Omaha, Nebraska, lay under undisturbed glacial deposits, and the remains were those of men who lived in America in the Glacial period. The importance of the statement lies in the fact that these men were of the modern type—in one case exactly of the Red Indian type.

(3) Prof. Giuffrida Ruggeri's book deals with another aspect of the problem of man's origin. Its inception dates from his visit to London two years ago, when he attended the Universal Races Congress. He was surprised to hear the speculations of Prof. Klaatsch regarding the independent origin of human races—brought forward by those who took part in the discussions of the congress—as if they were facts accepted by all anthropologists. It will be remembered that Prof. Klaatsch saw fanciful resemblances between certain races of mankind and certain anthropoids, and supposed such races and anthropoids had sprung together from a common stock. In the process of dismembering Prof. Klaatsch's theory, the Neapolitan pro-

fessor has done anthropologists a great service by bringing together and systematising all recent investigations concerning the origin and nature of modern races of mankind. He regards the human race not as an "ideal" species—one composed of a predominant single variety: it would become so if one race prevailed and exterminated all the others—but as a collective species comprising many varieties of equal value in the eye of the classifier. His classification of modern races is a very practical one.

(4) We have kept the most important of the four books here reviewed to the last—for there can be no doubt, from every point of view, that Prof. Eugen Fischer's book merits such commendation. What happens when two diverse races of mankind interbreed throughout a long series of generations? Is a new race of mankind thus produced—a race which will continue to reproduce characters intermediate to those of the parent stocks? At the present time such an opinion is tacitly accepted by most anthropologists. It was to test the truth of such an opinion that Dr. Eugen Fischer, professor of anthropology at Freiburg, with financial assistance from the Royal Academy of Sciences of Berlin, set out to investigate the Bastard people in the Rehoboth district of German South-West Africa. The Rehoboth Bastards form a community of 2500–3000 souls, and are the result of intermarriage between early Boer farmers and Hottentot women—an intermixture which began more than a century ago.

This book contains the results of Prof. Fischer's investigations and is a model for those who will follow in his footsteps. His observations have convinced him that a new and permanent human race cannot be formed by the amalgamation of two diverse forms of man—not from any want of fertility—for amongst the Bastards there is an average of 7·4 children to each family—but because certain characters are recessive, others are dominant, and the original types tend to reassert themselves in the course of generations, according to Mendel's law. Although the mean head-form of the Bastards is intermediate to those of the two parent races—Hottentot and Boer—yet in each generation a definite number of the Bastards tend to assume the head-form of the one or of the other of the parent races. There are certain facts relating to head-form known to English anthropologists which can be explained only on a Mendelian basis and are in harmony with Dr. Fischer's observations. Between three and four thousand years ago England was invaded by a race with peculiarly formed, short and high heads. During those thousands of years the Bronze age invaders have been mingling their

blood with that of the older and newer residents of England. Yet in every gathering of modern Englishmen—especially of the middle classes—one can see a number of pure examples of the Bronze age head-form. On the Mendelian hypothesis the persistence of such a head-form is explicable.

Dr. Eugen Fischer's study of the Rehoboth Bastards will be welcomed by all students of heredity. No race has so many peculiar human traits as the Hottentots, and hence the laws of human inheritance—as Prof. Fischer was the first to recognise—can be advantageously studied in their hybrid progeny.

"FLORAS" AND PLANT MONOGRAPHS.

- (1) *A Manual Flora of Egypt*. By Dr. Reno Muschler. With a preface by Prof. Paul Ascherson and Prof. Georg Schweinfurth. Two volumes. Pp. xii+1312. (Berlin: R. Friedländer und Sohn, 1912.)
- (2) *Bush Days*. By Amy E. Mack. With illustrations from photographs by J. Ramsay and L. Harrison. Pp. xii+132. (Sydney: Angus and Robertson, Ltd.; London: Australian Book Company, 1911.) Price 3s. 6d. net.
- (3) *The Flora of Bristol: Being an account of all the Flowering Plants, Ferns, and their Allies that have at any time been found in the district of the Bristol Coal-Fields*. By J. W. White. Pp. ix+722+3 plates+map. (Bristol: John Wright & Sons, Ltd.; London: Simpkin, Marshall and Co., Ltd., 1912.) Price 13s. 6d. net.
- (4) *Pflanzengeographische Monographie des Berninagebietes*. By Dr. E. Rübel. Pp. x+615+xxxvi plates. (Leipzig: W. Engelmann, 1912.) Price 8 marks.
- (5) *Das Pflanzenreich: Regni vegetabilis conspectus*. Herausgegeben von A. Engler. 53 Heft. iv. 129. Geraniaceæ. By R. Knuth. Pp. 640. Price 32 marks. 54 Heft. iv. 277 u. 277a. Goodeniaceæ und Brunoniaceæ. By K. Krause. Pp. 207+6. (Leipzig: W. Engelmann, 1912.) Price 10.80 marks.

(1) **D**R. MUSCHLER'S "Flora of Egypt" has grown from the work of Ascherson and Schweinfurth, whose "Illustration de la flora d'Egypte," published in 1887, was the first modern account of the vegetation of the country. In this work 1215 species were enumerated, and the number was increased in a supplement, issued two years later, to 1316. In the preparation of the present work, Dr. Muschler has had the advantage of the unpublished additional notes by the two veteran workers and also the use of their extensive herbarium. The number of species (of flowering plants and ferns) is brought up to 1505.